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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,574	09/27/2006	Motohisa Kamijo	040356-0595	6805

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EXAMINER	
AKRAM, IMRAN	

ART UNIT	PAPER NUMBER
1795	

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03/15/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/594,574	KAMIJO ET AL.	
	Examiner	Art Unit	
	IMRAN AKRAM	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 February 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Objections to the title and the IDS filed 9/27/06 have been withdrawn.

Response to Arguments

2. Applicant's arguments filed 1/15/10 have been fully considered but they are not persuasive. The Tonkovich reference still applies, albeit in different form necessitated by amendment.

3. Applicant's first argument merely asserts that the Tonkovich reference does not disclose the claimed features. Arguments are not presented as to why Applicant believes this to be the case. The Tonkovich reference necessitates the rejection as shown in the rejection below.

4. Applicant's second argument is moot in light of the new rejection presented below necessitated by amendment.

5. Applicant's third argument asserts that the present invention is "thinner" than that of Tonkovich. This is a spurious argument. Nothing in the claims requires distinction in physical dimensions between the current invention and the reference.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 21-37 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tonkovich (US 2003/0072699 A1).

10. Regarding claim 21, Tonkovich discloses a reforming element **132** comprising: a reforming passage **52** and a reforming catalyst **57** located within that passage which generates reformate gas from fuel (paragraph 50); a gas manifold **120** that collects hydrogen gas from source **104**; and plural supply passages **133** in communication with the gas manifold **120** (paragraph 130), the reforming passages **52** being disposed

between the supply passages **133** (see figure 19e). Tonkovich discloses a combustion element **122** comprising: a combustion gas passage **54** which heats the reforming element by burning hydrogen with air (paragraph 50), the reforming element and the combustion element being laminated (paragraph 46). Tonkovich discloses plural supply holes **131** arranged in a line along the combustion passages (see figure 19d), each supply hole communicating with the combustion passages, the supply passages, and located between the reforming element and combustion element (see figure 19e).

11. Tonkovich does not disclose that the manifold **120** collects reformate from the reformer element and uses that hydrogen for combustion in the combustion passages. A source of hydrogen for the combustion element is, of course, necessary and disclosed (paragraph 50). Using the generated hydrogen in the process would make the system closed, more efficient, and would generate less waste. It would have been obvious to one having ordinary skill in the art at the time of invention to use the reformate produced in Tonkovich as the hydrogen source inputted into the manifold for combustion to eliminate the necessity for additional hydrogen for the process.

12. Regarding claim 22, Tonkovich discloses that the plural supply holes **131** are disposed at a substantially predetermined interval along said at least one combustion gas passage (see figure 19d).

13. Regarding claim 23, Tonkovich discloses a partition **125** disposed between the plural supply passages **133** and said at least one combustion gas passage **54**, the partition having the plural supply holes **131** in parts where the plural supply passages overlie or underlie said at least one combustion gas passage (see figure 19d), wherein

each supply passage communicates with a corresponding one of the plural supply holes (see figure 19e), so that the hydrogen gas of the reformate gas manifold is supplied to said at least one combustion gas passage via the supply passages and supply holes (see figure 19c).

14. Regarding claim 24, Tonkovich discloses a starting material vapor manifold (paragraph 121) to which vapor of the fuel is supplied and which communicates with said at least one reforming catalyst passage (paragraph 123).

15. Regarding claim 25, Tonkovich discloses that the partition is a horizontal part provided in the combustion element, and the horizontal part is substantially perpendicular to the lamination direction of the reforming element and combustion element (see figure 19c).

16. Regarding claims 26 and 27, Tonkovich discloses that the hydrogen gas is supplied from the manifold **120** to the combustion gas passage **54** via the supply passages **133** and **131** in a distribution manifold (paragraph 130).

17. Regarding claim 28, Tonkovich discloses that the distribution manifold and reformate gas manifold are configured to communicate by an external pipe of the fuel reformer (see SMR Product pipe of figure 19c).

18. Regarding claim 29, Tonkovich discloses that the supply passages of the reforming elements overlie or underlie said at least one combustion gas passage of the combustion elements (see figure 5).

19. Regarding claim 30, Tonkovich discloses that the reforming element comprises a starting material manifold **130** to which liquid fuel is supplied, and a starting material

vaporization passage **134** connecting the starting material vapor manifold and the starting material manifold, the liquid fuel from the starting material manifold vaporizes in the starting material vaporization passage, and the vaporized fuel is introduced into the starting material vapor manifold (paragraph 134).

20. Regarding claim 31, Tonkovich discloses that at least one of the supply passages and at least one of the supply holes are disposed between the starting material vaporization passage and one of said at least one reforming catalyst passage closest to the starting material vaporization passage (see figure 19b).

21. Regarding claim 32, Tonkovich discloses additional fuel supply means which supplies additional fuel to at least one of the openings of the supply passages in the reformate gas manifold (paragraph 50).

22. Regarding claim 33, Tonkovich discloses additional fuel supply means **104** which supplies additional fuel to an external pipe **118**, the external pipe communicating the distribution manifold and reformate gas manifold (see figure 19b).

23. Regarding claim 34, Tonkovich discloses that said at least one reforming catalyst passage of the reforming elements is formed by a groove, and a partition member which seals the groove (see figures 5 and 19b).

24. Regarding claim 35, Tonkovich discloses that said at least one combustion gas passage of the combustion element is formed by a groove, and a partition member which seals the groove or a horizontal part of the reforming element, the horizontal part is substantially perpendicular to the lamination direction of the reforming element and combustion element (see figures 5 and 19e).

25. Regarding claim 36, Tonkovich discloses that a wall surface of said at least one combustion gas passage of the combustion element supports an oxidation catalyst **53**.

26. Regarding claim 37, the pressure in the combustion element can be set lower than the pressure in the reforming element of Tonkovich. This is intended use language. The pressure in Tonkovich is effected by process conditions. See MPEP 2114 stipulating that apparatus claims must be structurally distinguishable from the prior art.

27. Regarding claim 40, Tonkovich discloses that the starting material vapor manifold and reformate gas manifold are such that they are open to the outer circumferential surface of the fuel reformer (see figure 19b) and that the starting material vapor manifold and reformate gas manifold are sealed by their respective cover member (paragraph 143). Whether the manifolds are formed whilst lamination is product-by-process language. Since the physical structure of claims 24 and the structural features of claim 40 are properly rejected, then the method of forming these structures is not given patentable weight.

28. Claims 38 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tonkovich and Powell as applied to claim 21 above, and further in view of Powell (US 2005/0172556 A1).

29. Tonkovich does not disclose a hydrogen separation means. Powell—in an invention for a reformer with combustion heating means—discloses the use of a hydrogen separation membrane **38** for collecting hydrogen from the reformate via a reaction channel plate reactor (see figure 2). It would have been obvious to one having

ordinary skill in the art at the time of the invention to include a hydrogen separation membrane as in Powell in the reformer holes of Tonkovich to collect only hydrogen from the reformate to be used as the hydrogen source for the combustor.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to IMRAN AKRAM whose telephone number is (571)270-3241. The examiner can normally be reached on 10-7 Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/I. A./
Examiner, Art Unit 1795

/Alexa D. Neckel/
Supervisory Patent Examiner, Art Unit 1795